

CGCCTGTGCCCTCTGCCTGGGAGCCTGGGGCCGCCTGTCTGCGCGGTCCGGATGCGCTCAGGTCAAGGTTCCTTTCG  
 CGGCTGTCTCCCAAGCCCCCTAACTAGTGACTTCCACTGTGGCGGGCAGGGAAGCCATTGGCAGAACCTAGCCAGTCA  
 GGAATCTGCATCTCTTCCCTCATTATCCTCTCCCTGGCATTGCTTTGCTCGGGTCCAGCTCAGTTGGTGACGCGGCC  
 CCTTCTCCCCAGGTTGGGATCCACGGAAGCAGGGGTGAGGCCGCGCCAGGCACTGTGCCATGAGCCAGAGCCCCGAGG  
 TTCGTGACCCGGAGGGGCGGCTCTCTAAAGGCTGCCCCCTGGAGCCGGCACCCGGCGCAACGAGAGCCAGGACTATTT  
 GCTGATGGACGAGCTGGGAGACGACGGCTACCCGCAGCTCCCGCTGCCACCGTATGGCTACTACCCAGCTTCCGGG  
 GTAATGAAAACAGACTGACTCACCGGCGGCAGACGATTCTTCGTGAGAAGGGAAGAAGGTTAGCTAATCGAGGACCA  
 GCATACATGTTTTAATGATCATTCAACAAGCCTGTCTATTGAGGAAGAAGCCTTTCTAGATGCAGTTGAATATGGCAA  
 CATCCCAGTGGTCTGGAAGATGCTAGAAGAGTGTCATTCCCTCAATGTTAACTGTGTGGATTACATGGGCCAGAATG  
 CCCTACAGCTGGCTGTGGCCAAATGAGCACTTGGAAATCACAGAGCTGCTACTCAAGAAGGAAAACCTGTCTCGAGTT  
 GGGGATGCTTTACTTTTAGCCATTAGTAAAGGTTATGTACGGATTGTGGAGGCAATCCTCAACCATCCATCTTTTGC  
 TGAAGGCAAAAGGTTAGCGACAAGCCCCAGCCAGTCTGAACTTCAGCAAGATGACTTTTATGCCTATGATGAAGATG  
 GGACGCGGTTCTCCCATGATGTGACTCCAATCATTCTCGCTGCACATTGCCAGGAATATGAAATTGTGCATACCCTC  
 CTGAGAAAGGGTGCCCGGATTGAGCGGCTCATGATTACTTCTGCAAGTGTACAGAATGCAGCCAGAAGCAGAAGCA  
 TGATTCTTCAGCCACTCTAGATCCAGGATCAATGCATACAAAGGTCTGGCAAGTCCAGCATACCTGTCTATTGTCCA  
 GTGAAGATCCAGTCATGACTGCTTTAGAACTTAGCAATGAGCTGGCAGTGCTTGCCAACATTGAGAAAGAGTTCAAG  
 AATGACTACAGGAAGCTGTCTATGCAGTGCAAGGATTTTCGTGTTGGTCTCTTGACCTCTGCAGAAACACAGAGGA  
 AGTGGAGGCCATCCTGAATGGGGATGCAGAGACTCGCCAGCCCCGGGACTTCGGCCGTCCAAATCTCAGCCGTTTAA  
 AACTTGCTATTAAGGATGAAGTAAAAAATTTGTGGCTCATCCAACTGTGCAACAGCTCCTGTCCATATGGTAT  
 GAGAACCCTCTCTGTTTTACGGCAGCAGACCATGGCAGTGAAGTTTCCTCGTGGTCTCTGCTGTTGCCATTGGATTGCC  
 CTTCCTGGCTCTCATATACTGGTGTGCTCCTTGCAGCAAGATGGGGAAGATATTGCCGAGACCGTTTCATGAAGTTTG  
 TAGCACACGCAGCCTCCTTACCATTTCCTGGGGCTGCTCGTCATGAATGCAGCTGACAGATTTGAAGGCACCAAG  
 CTCCTCCCTAATGAAACCAGCACAGATAATGCAAGGCAGCTGTTTCAGGATGAAAACATCCTGTTTTCTCATGGATGGA  
 GATGCTCATTATATCCTGGGTAATAGGCATGATATGGGCTGAATGTAAAGAAATCTGGACTCAAGGCCCAAAGAAT  
 ACTTATTTGAGTTGTGGAATATGCTTGACTTTGGAATGCTGGCAATCTTTGCAGCATCATTCAATTGCAAGATTTATG  
 GCGTTCTGGCATGCATCCAAAGCTCAGAGCATCATTGATGCAAATGATACTTTAAAGGATTTGACAAAAGTCACACT  
 GGGGGACAACGTTAAATACTACAATCTGGCCAGGATAAAGTGGGACCCTACTGATCCTCAGATCATCTCTGAAGGTC  
 TTTATGCAATCGCTGTGGTTTTAAGTTTCTCCAGAATAGCTTACATTTTACCAGCAAATGAAAGCTTTGGACCTCTG  
 CAGATTTCACTTGGAAGAACAGTGAAAGATATCTTCAAATTCATGGTCATATTATCATGTTGTTTGTAGCCTTTAT  
 GATTGGAATGTTCAACCTTTACTCCTACTACATTGGCGCAAAACAGAATGAAGCATTACAACAGTTGAGGAAAAGTT  
 TTAAGACACTGTTCTGGGCTATCTTTGGTCTTTCTGAAGTGAAGTCAGTGGTCATTAACTACAATCACAGTTTCATT  
 GAAAACATCGGCTACGTTCTGTATGGTGTCTATAATGTACAATGGTCATTGTTTTGCTAAATATGTTAATTGCCGAT  
 GATCAATAGTTTCATTCCAGGAAATTGAGGATGATGCGGACGTGGAGTGGAAGTTTGCAAGGGCCAAATTGTGGTTTT  
 CCTACTTTGAGGAGGGGAGAACACTTCCTGTCCCCTTCAATCTTGTAACCAAGTCCAAAATCCTTGCTTTATCTCCTA  
 TTGAAATTTAAGAAATGGATGTGTGAGCTCATCCAGGGTCAAAGCAAGGCTTCCAAGAAGATGCAGAGATGAACAA  
 GAGAAATGAAGAAAAGAAATTTGGAATTTAGGAAGTCACGAAGACCTTTCAAATTTTCACTTGACAAAAATCAGT  
 TGGCACACAACAAACAATCAAGTACAAGGAGCTCAGAAGATTATCATTTAAATAGTTTCAGTAACCCCTCCAAGACAA  
 TATCAGAAAAATCATGAAGAGACTCATTAAAGATATGTATTGCAGGCCAGATTGATAAGGAGAGCGATGAGGTGAA  
 TGAAGGGGAATTGAAGGAAATTAAGCAAGACATCTCAAGTCTCCGTTATGAACTCCTTGAAGAGAAATCACAGAACT  
 CAGAAGACCTAGCAGAGCTCATTAGAAAACCTCGGGGAGAGACTGTGCTTAGAGCCAAAGCTGGAGGAAAGCCGAGA  
 TAGAGCAGAGCCCCCTCAGAAGTGCATATTTATTTCTCCACTTGAAGCCATATTATTTTCTGACTTATTTTTTTAAGT  
 GTCAATGATAAAAAGTATGTTAACTGATAACTTGGATCATTTAGAGTCCTAATATCAAGCTTTTGGGAGATTAAAT  
 TGCATTGCTGAGGGCTAACAATTGCTG (SEQ ID NO:1)

FIGURE 1

10031612001

MSQSPRFVTRRGSLKAAPGAGTRRNESQDYLLMDELGDDGYPQLPLPPYGYYPSPFRGNENRLTHRRQTI  
LREKGRRLANRGPAYMFNDHSTSLSEERFLDAVEYGNIPVVWKMLEECHSLNVNCVDYMGQNALQLAV  
ANEHLEITELLKKENLSRVGDALLLAISKGYVRIVEAILNHPSFAEGKRLATSPSQSELQODDFYAYDE  
DGTRFSDHVTPIILAAHCQEYEIVHTLLRKGARIERPHDYFCKCTECSQKQKHDSFSHSRSRINAYKGLA  
SPAYLSLSSDPVMTALELSNELAVLANIEKEFKNDYRKLSMQCKDFVVGLLDLCRNTEEEVEAILNGDAE  
TRQPGDFGRPNLSRLKLAIKDEVKKFVAHPNCQQQLLSIWYENLSGLRQQTMAVKFLVVLAVAIGLPFLA  
LIYWCAPCSKMGKILPRPFMKFVAHAASFTIFLGLVMNAADRFEGTKLLPNETSTDNARQLFRMKTSCF  
SWMEMLIISWVIGMIWAECKEIWTOGPKEYLFELWNMLDFGMLAIFAASFIARFMAFWHASKAQSIIDAN  
DTLKDLTKVTLGDNVKYYNLARIKWDPTDPOIISEGLYAIHAVVLSFSRIAYILPANESFGPLQISLGRTV  
KDIFKFMVIFIMVFVAFMIGMFNLYSYYIGAKQNEAFTTVEESFKTLFWAIFGLSEVKSVVINYNHKEIE  
NIGYVLYGVYNVTMVIVLLNMLIAMINSSFQEIEDDADVEWKFARAKLWFSYFEEGRTLVPVFNLVSPK  
SLLYLLLKFKKWMCELIQGQKQGFQEDAEMNKRNEKKFGISGSHEDLSKFSLDKNQLAHNKQSSTRSSE  
DYHLNSFSNPPRQYQKIMKRLIKRYVLQAQIDKESDEVNEGELKEIKQDISSLRYELLEKSQNSDLAE  
LIRKLGERLSLEPKLEESRR (SEQ ID NO:2)

**FIGURE 2**

underlined = deleted in targeting construct

**BOLD** = sequence flanking Neo insert in targeting construct

CGCCTGTGCCCTCTGCCTGGGAGCCTGGGGCCGCCTGTCTGCGCGGTCCGGATGCGCTCAGGTCAAGGTTCCCT  
 TTCGCGGCTGTCTCCCAAGCCCCTAACTAGTGACTTCCACTGTGGCGGGCAGGGAAGCCATTGGCAGAACCTA  
 GCCAGTCAGGAATCTGCATCTCTTCCCTCATTATCCTCTCCCTGGCATTGCTTTGCTCGGGTCCAGCTCAGTT  
 GGTGACGCGGCCCCCTTCTCCCCAGGTTGGGATCCACGGAAGCAGGGGTGCAGGCCGGCCAGGCACTGTGCCAT  
 GAGCCAGAGCCCCGAGGTTCTGTGACCCGAGGGGCGGCTCTCTAAAGGCTGCCCTGGAGCCGGCACCCGGCGC  
 AACGAGAGCCAGGACTATTTGCTGATGGACGAGCTGGGAGACGACGGCTACCCGAGCTCCCGCTGCCACCGT  
 ATGGCTACTACCCAGCTTCCGGGGTAATGAAAACAGACTGACTCACCGGCGGCAGACGATTCTTCGTGAGAA  
 GGAAGAAGGTTAGCTAATCGAGGACCAGCATACATGTTTAAATGATCATTCAACAAGCCTGTCTATTGAGGAA  
 GAACGCTTTCTAGATGCAGTTGAATATGGCAACATCCAGTGGTCTGGAAGATGCTAGAAGAGTGTCATTCCC  
 TCAATGTAACTGTGTGGATTACATGGGCCAGAATGCCCTACAGCTGGCTGTGGCCAATGAGCACTTGGAAAT  
 CACAGAGCTGCTACTCAAGAAGGAAAAC'TTGTCTCGAGTTGGGGATGCTTTACTTTTAGCCATTAGTAAAGGT  
 TATGTACGGATTGTGGAGGCAATCCTCAACCATCCATCTTTTGTGAAGGCAAAAAGGTTAGCGACAAGCCCCA  
 GCCAGTCTGAAC'TTCAGCAAGATGACTTTTATGCCTATGATGAAGATGGGACGCGGTTCTCCCATGATGTGAC  
 TCCAATCATTCTCGCTGCACATTGCCAGGAATATGAAAT'TGTGCATACCCTCCTGAGAAAGGTTGCCCGGATT  
 GAGCGGCCTCATGATTACTTCTGCAAGTGTACAGAATGCAGCCAGAAGCAGAAGCATGATTCTTCAGCCACT  
 CTAGATCCAGGATCAATGCATACAAAGGTCTGGCAAGTCCAGCATACCTGTCTATTGTCCAGTGAAGATCCAGT  
 CATGACTGCTTTAGAACTTAGCAATGAGCTGGCAGTGCTTGCCAACATTGAGAAAGAGTTCAAGAATGACTAC  
 AGGAAGCTGTCTATGCAGTGAAGGATTTCTGTTGTTGGTCTCTTGGACCTCTGCAGAAACACAGAGGAAGTGG  
 AGGCCATCCTGAATGGGGATGCAGAGACTCGCCAGCCCCGGGACTTCCGCCGTCCAAATCTCAGCCGTTTAAA  
 ACTTGTCTATTAAGGATGAAGTAAAAAAATTTGTGGCTCATCCAAACTGTCTAGCAACAGCTCCTGTCCATATGG  
**TATGAGAACCTCTCTGGTTTACGGCAGCAGACCATGGCAGTGAAGTTCCTCGTGGTCTTTGCTGTTGCCATTG**  
**GATTGCCCTTCTGGCTCTCATATACTGGTGTGCTCCTTGCAAGATGGGGAAGATATTGCCGAGACCGTT**  
 CATGAAGTTTGTATGCACACAGCCCTCCTTACCATTCTTCTGGGGCTGCTCGTCATGAATGCAGCTGACAGA  
 TTTGAAGGCACCAAGCTCCTCCCTAATGAAACCAGCACAGATAATGCAAGGCAGCTGTTCCAGGATGAAAACAT  
 CCTGTTTCTCATGGATGGAGATGCTCATTATATCCTGGGTAATAGGCATGATATGGGCTGAATGTAAAGAAAT  
 CTGGACTCAAGGCCCCAAAGAATACTTTTGTAGTTGTGGAATATGCTTGACTTTGGAATCTGGCAATCTTT  
 GCAGCATCATTCAATTGCAAGATTTATGGCGTTCTGGCATGCATCCAAAGCTCAGAGCATCATTGATGCAATG  
 ATACTTTAAAGGATTTGACAAAAGTCACACTGGGGGACAACGTTAAATACTACAATCTGGCCAGGATAAAGTG  
 GGACCCTACTGATCCTCAGATCATCTCTGAAGGTCTTTATGCAATCGCTGTGGTTTTTAAGTTTCTCCAGAATA  
 GCTTACATTTTACCAGCAAATGAAAGCTTTGGACCTCTGCAGATTTCACTTGGAAGAACAGTGAAAGATATCT  
 TCAAATTCATGGTCATATTCATCATGGTGTTTGTAGCCTTTATGATTGGAATGTTCAACCTTTACTCCTACTA  
 CATTGGCGCAAAACAGAATGAAGCATTCAACAAGTTGAGGAAAGTTTTAAGACACTGTTCTGGGCTATCTTT  
 GGTCTTTCTGAAGTGAAGTCACTGGTCACTTAATACTACAATCACAAGTTCATTGAAAACATCGGCTACGTTCTGT  
 ATGGTGTCTATAATGTCACAATGGTCACTGTTTGTCTAAATATGTTAATTGCGATGATCAATAGTTCAATCCA  
 GGAAATTGAGGATGATGCGGACGTGGAGTGGAGTTTGAAGGGCCAAATTGTGGTTTTCTACTTTGAGGAG  
 GGGAGAACCTTCTGTCCCTTCAATCTTGTACCAAGTCCAAAATCCTTGCTTTATCTCCTATTGAAATTTA  
 AGAAATGGATGTGTGAGCTCATCCAGGCTCAAAAGCAAGGCTTCCAAGAAGATGCAGAGATGAACAAGAGAAA  
 TGAAGAAAAGAAATTTGGAATTTAGGAAGTCACGAAGACCTTTCAAAATTTTCACTTGACAAAATCAGTTG  
 GCACACAACAAACAATCAAGTACAAGGAGCTCAGAAGATTATCATTTAAATAGTTTCAGTAACCTTCCAAGAC  
 AATATCAGAAAATCATGAAGAGACTCATTAAGAGATATGTATTGCAGGCCAGATTGATAAGGAGAGCGATGA  
 GGTGAATGAAGGGGAATTGAAGGAAATTAAGCAAGACATCTCAAGTCTCCGTTATGAACTCCTTGAAGAGAAA  
 TCACAGAACTCAGAAGACCTAGCAGAGCTCATTAGAAAACCTCGGGGAGAGACTGTCTGTTAGAGCCAAAGCTGG  
 AGGAAAGCCGCAGATAGAGCAGAGCCCCCTCAGAAGTGCATATTTATTTCTCCACTTGAAGCCATATTATTTTC  
 TGACTTATTTTTTTTAAAGTGTCAATGATAAAAAGTATGTTAACTGATAAAGTTGGATCATTTAGAGTCCTAATAT  
 CAAGCTTTTTTGGGAGATTAAATTGCAATTGCTGAGGGCTAACAATTGCTG

**FIGURE 3**

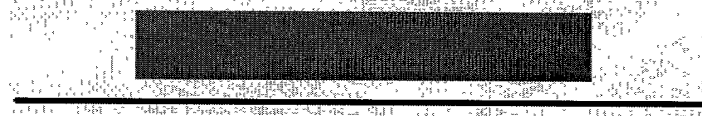
## Gene Sequence Structure \*

1497 bp

Sequence Deleted

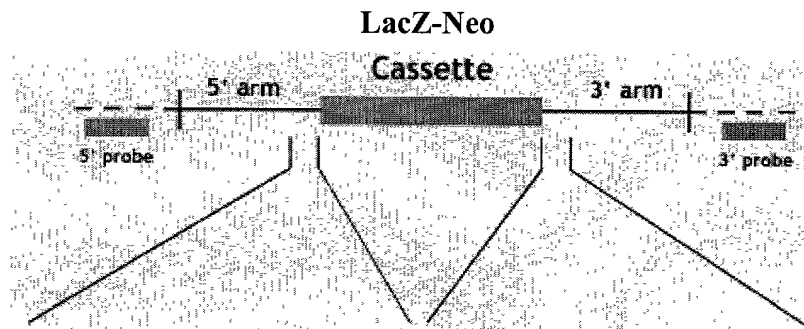
1509 bp

Size of full-length  
cDNA: 3261 bp



Targeting Vector\*  
(genomic sequence)

Arm Length:  
5': 3.5 kb  
3': 1.5 kb



Targeting Vector  
Endogenous Locus  
\* Not drawn to scale

<p>5' &gt;TCCTCAATTCTAACTGCATTT CTTCTGGAAAAGAATAAAACGATT CACCAGAGCTCCAGAGGATAGCCT AAGCTGAGTTGTTTTTAATCAAAT CATTCTGTGTGCTGTCTCACCCCT AGTTTGTGGCTCATCCAAGCTGTC AGCAACAGCTCCTGTCCATATGGT ATGAGAACCTCTCTGGTTTACGGC AGCAGACCATG&lt;3' (SEQ ID NO:3)</p>	<p>5' &gt;TCGTGGTCCTTGCTGTTGCCA TTGGATTGCCCTTCTGGCTCTCA TATACTGGTGTGCTCCTTGACGA AGGTATGTCTGTGAGTCCTGCAGT CCATCTGTAGTTGAATTCTGTCCA GCAGGCAAAGATCTAGCTCCAAAA TGAAAATATGATTTGAAGTACACA GGTTCACATAATCTTTCTATTTGT TTGAGAATTTTC&lt;3' (SEQ ID NO:4)</p>
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FIGURE 4

5/5

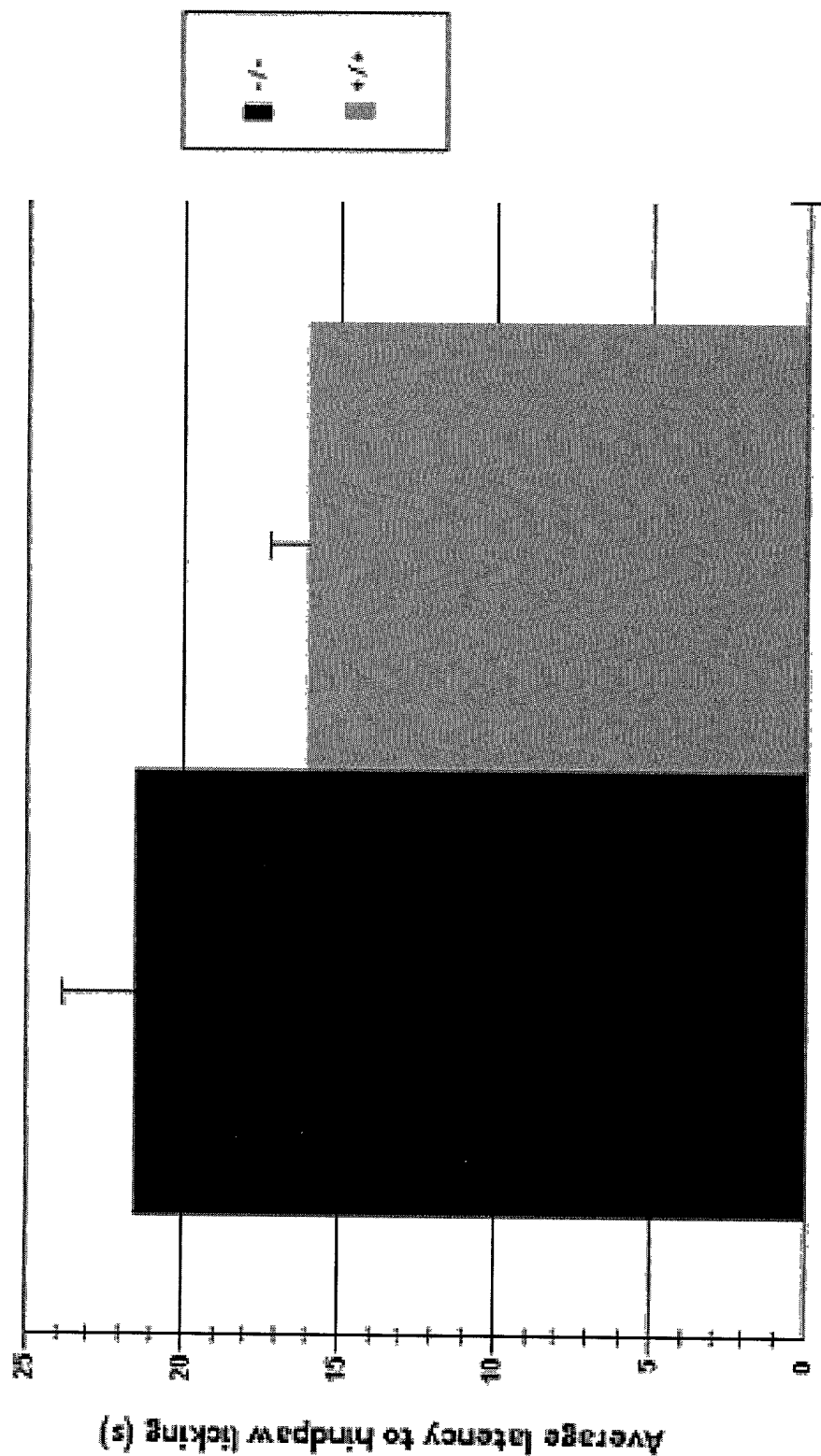


FIGURE 5